1 **Myers' Psychology for AP***

2 **Unit 3A:**
Biological Bases of Behavior:
Neural Processing and the Endocrine System

3 **Unit Overview**

- Neural Communication
- The Nervous System
- The Endocrine System

4 **Neural Communication**

5 **Introduction**

- Biological psychology
  - –Biopsychosocial systems

6 **Neurons**

- Neuron
  - –Sensory neurons
  - –Motor neurons
  - –Interneurons

7 **Neurons**

- Parts of a Neuron
  - –Dendrite
  - –Axon
  - –Myelin sheath
    - Multiple sclerosis
  - –Terminal branches
  - –Cell body

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15 **Neurons**

- Speed of a neuron impulse
  - –Range from 2 to 200 MPH
  - –Measured in milliseconds
    - (thousandths of a second)

16 **Neurons**

- Firing of a neuron
  - –Action potential
  - –Ions
    - Positively versus negatively charged
  - –Resting potential
  - –Selectively permeable

17 **Neurons**

- Firing of a neuron
  - –Depolarize
  - –Refractory period
  - –Excitatory versus inhibitory
  - –Threshold
  - –All or none response

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23 **How Neurons Communicate**

- Synapse
- Synaptic gap (synaptic cleft)
- Neurotransmitters
- Reuptake

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29 **How Neurotransmitters Influence Us**

- Acetylcholine (AcH)
- Dopamine
- Serotonin
- Norepinephrine
- GABA
- Glutamate
- Endorphins

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37 **How Neurotransmitters Influence Us**

How Drugs and Other Chemicals Alter Neurotransmitters

- Agonists versus antagonists
  - –Agonists
  - –antagonists

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42 **The Nervous System**

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50 **Introduction**

- Nervous System

- –Central Nervous System (CNS)
- –Peripheral Nervous System (PNS)
- Nerves

51 **The Peripheral Nervous System**

- Somatic Nervous System
- Autonomic Nervous System
  - –Sympathetic nervous system
  - –Parasympathetic nervous system

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53 **The Central Nervous System**

- Brain and spinal cord
- Neural networks
- Spinal cord
  - –Reflex

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57 **The Endocrine System**

58 **Endocrine System**

- Endocrine system
  - –Hormones
  - –Adrenal glands
    - Epinephrine and norepinephrine
    - Adrenaline and noradrenaline
    - Fight or flight response
  - –Pituitary gland

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67 **The End**

68 **Teacher Information**

- Types of Files
  - This presentation has been saved as a “basic” Powerpoint file. While this file format placed a few limitations on the presentation, it insured the file would be compatible with the many versions of Powerpoint teachers use. To add functionality to the presentation, teachers may want to save the file for their specific version of Powerpoint.
- Animation
  - Once again, to insure compatibility with all versions of Powerpoint, none of the slides are animated. To increase student interest, it is suggested teachers animate the slides wherever possible.
- Adding slides to this presentation
  - Teachers are encouraged to adapt this presentation to their personal teaching style. To help keep a sense of continuity, blank slides which can be copied and pasted to a specific location in the presentation follow this “Teacher Information” section.

69 **Teacher Information**

- Hyperlink Slides - This presentation contain two types of hyperlinks. Hyperlinks can be identified by the text being

underlined and a different color (usually purple).

- Unit subsections hyperlinks: Immediately after the unit title slide, a page (slide #3) can be found listing all of the unit's subsections. While in slide show mode, clicking on any of these hyperlinks will take the user directly to the beginning of that subsection. This allows teachers quick access to each subsection.
- Bold print term hyperlinks: Every bold print term from the unit is included in this presentation as a hyperlink. While in slide show mode, clicking on any of the hyperlinks will take the user to a slide containing the formal definition of the term. Clicking on the "arrow" in the bottom left corner of the definition slide will take the user back to the original point in the presentation.

  These hyperlinks were included for teachers who want students to see or copy down the exact definition as stated in the text. Most teachers prefer the definitions not be included to prevent students from only "copying down what is on the screen" and not actively listening to the presentation.

  For teachers who continually use the Bold Print Term Hyperlinks option, please contact the author using the email address on the next slide to learn a technique to expedite the returning to the original point in the presentation.

70 **Teacher Information**

- Continuity slides
  - Throughout this presentation there are slides, usually of graphics or tables, that build on one another. These are included for three purposes.
    - By presenting information in small chunks, students will find it easier to process and remember the concepts.
    - By continually changing slides, students will stay interested in the presentation.

- To facilitate class discussion and critical thinking. Students should be encouraged to think about "what might come next" in the series of slides.
- Please feel free to contact me at kkorek@germantown.k12.wi.us with any questions, concerns, suggestions, etc. regarding these presentations.

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71 **Division title (green print)**
subdivision title (*blue print)*

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  - xxx

72 **Division title (green print)**
subdivision title (*blue print)*

73 **Definition Slide**

= add definition here

74 **Definition Slides**

75 **Biological Psychology**

= a branch of psychology concerned with the links between biology and behavior.

- Some biological psychologists call themselves
  - behavioral neuroscientists,
  - neuropsychologists,
  - behavior geneticists,
  - physiological psychologists, or
  - biopsychologists.

76 **Neuron**

= a nerve cell; the basic building block of the nervous system.

77 **Sensory Neurons**

= neurons that carry incoming information from the sensory receptors to the brain and spinal cord.

78 **Motor Neurons**

= neurons that carry outgoing information from the brain and spinal cord to the muscles and glands.

79 **Interneurons**

= neurons within the brain and spinal cord that communicate internally and intervene between the sensory inputs and motor outputs.

80 **Dendrite**

= the bushy, branching extensions of a neuron that receive messages and conduct impulses toward the cell body.

81 **Axon**

= the extension of a neuron, ending in branching terminal fibers, through which messages pass to other neurons or to muscles or glands.

82 **Myelin Sheath**

= a layer of fatty tissue segmentally encasing the fibers of many neurons; enables vastly greater transmission speed of neural impulses as the impulse hops from one node to the next.

83 **Action Potential**

= a neural impulse; a brief electrical charge that travels down an axon.

84 **Threshold**

= a level of stimulation required to trigger a neural impulse.

85 **Synapse**

= the junction between the axon tip of the sending neuron and the dendrite or cell body of the receiving neuron. The tiny gap at this junction is called the synaptic gap or synaptic

cleft.

86 **Neurotransmitters**

= chemical messengers that cross the synaptic gaps between neurons. When released by the sending neuron, neurotransmitters travel across the synapse and bind to receptor sites on the receiving neuron, thereby influencing whether that neuron will generate a neural impulse.

87 **Reuptake**

= a neurotransmitter's reabsorption by the sending neuron.

88 **Endorphins**

= "morphine within" – natural, opiatelike neurotransmitters linked to pain control and pleasure.

89 **Nervous System**

= the body's speedy, electrochemical communication network, consisting of all the nerve cells of the peripheral and central nervous systems.

90 **Central Nervous System**

= the brain and spinal cord.

91 **Peripheral Nervous System**

= the sensory and motor neurons that connect the central nervous system (CNS) to the rest of the body.

92 **Nerves**

= bundled axons that form neural "cables" connecting the central nervous system with muscles, glands, and sense organs.

93 **Somatic Nervous System**

= the division of the peripheral nervous system that controls the body's skeletal muscles.

• Also called the skeletal nervous system.

94 **Autonomic Nervous System**

= the part of the peripheral nervous system that controls the

glands and the muscles of the internal organs (such as the heart). Its sympathetic division arouses; its parasympathetic division calms.

95 **Sympathetic Nervous System**

= the division of the autonomic nervous system that arouses the body, mobilizing its energy in stressful situations.

96 **Parasympathetic Nervous System**

= the division of the autonomic nervous system that calms the body, conserving its energy.

97 **Reflex**

= a simple, autonomic response to a sensory stimulus such as the knee-jerk response.

98 **Endocrine System**

= the body's "slow" chemical communication system; a set of glands that secrete hormones into the bloodstream.

99 **Hormones**

= chemical messengers that are manufactured by the endocrine glands, travel through the bloodstream, and affect other tissues.

100 **Adrenal Glands**

= a pair of endocrine glands that sit just above the kidneys and secrete hormones (epinephrine and norepinephrine) that help arouse the body in times of stress.

101 **Pituitary Gland**

= the endocrine system's most influential gland. Under the influence of the hypothalamus, the pituitary regulates growth and controls other endocrine glands.